

SEQUENCE LISTING

<110> Van Mellaert, Herman
Botterman, Johan
Van Rie, Jeroen
Joos, Henk

<120> RECOMBINANT PLANT EXPRESSING NON-COMPETITIVELY BINDING Bt INSECTICIDAL
CRYSTAL PROTEINS

<130> 021565-078

<140> 09/661,061

<141> September 13, 2000

<150> PCT/EP90/00905

<151> 1990-05-30

<150> GB 89401499.2

<151> 1989-05-31

<160> 8

<170> PatentIn Ver. 2.0

<210> 1

<211> 12

<212> DNA

<213> Bacillus thuringiensis

<400> 1

tggccagcgc ca

12

<210> 2

<211> 15

<212> DNA

<213> Bacillus thuringiensis

<400> 2

tgccagcgcc accat

15

<210> 3

<211> 28

<212> DNA

<213> Bacillus thuringiensis

<400> 3

cggaggtatt ccatggagga aaataatc

28

RECEIVED
JUL 15 2003
TECH CENTER 1600/2900

03 JUL 15 2003
TECH CENTER 1600/2900

<210> 4
 <211> 34
 <212> DNA
 <213> Bacillus thuringiensis

<400> 4
 cctatttgaa gccatggtaa ctctccttt tatg

34

<210> 5
 <211> 3903
 <212> DNA
 <213> Bacillus thuringiensis

<220>
 <221> CDS
 <222> (264)..(3761)

<400> 5
 ggatctgttt taatataagg gatttgtgcc cttctcgta tattctttta ttagcccca 60
 aaactagtgc aactaaatat ttttataatt acactgatta aatactttat ttttgggagt 120
 aagatttatg ctgaaatgta ataaaattcg ttccattttc tgtattttct cataaaatgt 180
 ttcatatgct ttaaattgta gtaaagaaaa acagtacaaa cttaaaagga ctttagtaat 240
 ttaataaaaa aaggggatag ttt atg gaa ata aat aat caa aac caa tgt gtg 293
 Met Glu Ile Asn Asn Gln Asn Gln Cys Val

1 5 10

cct tac aat tgt tta agt aat cct aag gag ata ata tta ggc gag gaa 341
 Pro Tyr Asn Cys Leu Ser Asn Pro Lys Glu Ile Ile Leu Gly Glu Glu
 15 20 25

agg cta gaa aca ggg aat act gta gca gac att tca tta ggg ctt att 389
 Arg Leu Glu Thr Gly Asn Thr Val Ala Asp Ile Ser Leu Gly Leu Ile
 30 35 40

aat ttt cta tat tct aat ttt gta cca gga gga gga ttt ata gta ggt 437
 Asn Phe Leu Tyr Ser Asn Phe Val Pro Gly Gly Gly Phe Ile Val Gly
 45 50 55

tta cta gaa tta ata tgg gga ttt ata ggg cct tcg caa tgg gat att 485
 Leu Leu Glu Leu Ile Trp Gly Phe Ile Gly Pro Ser Gln Trp Asp Ile
 60 65 70

ttt tta gct caa att gag caa ttg att agt caa aga ata gaa gaa ttt 533
 Phe Leu Ala Gln Ile Glu Gln Leu Ile Ser Gln Arg Ile Glu Glu Phe
 75 80 85 90

gct agg aat cag gca att tca aga ttg gag ggg cta agc aat ctt tat 581
 Ala Arg Asn Gln Ala Ile Ser Arg Leu Glu Gly Leu Ser Asn Leu Tyr
 95 100 105

aag gtc tat gtt aga gcg ttt agc gac tgg gag aaa gat cct act aat	629
Lys Val Tyr Val Arg Ala Phe Ser Asp Trp Glu Lys Asp Pro Thr Asn	
110 115 120	
cct gct tta agg gaa gaa atg cgt ata caa ttt aat gac atg aat agt	677
Pro Ala Leu Arg Glu Glu Met Arg Ile Gln Phe Asn Asp Met Asn Ser	
125 130 135	
gct ctc ata acg gct att cca ctt ttt aga gtt caa aat tat gaa gtt	725
Ala Leu Ile Thr Ala Ile Pro Leu Phe Arg Val Gln Asn Tyr Glu Val	
140 145 150	
gct ctt tta tct gta tat gtt caa gcc gca aac tta cat tta tct att	773
Ala Leu Leu Ser Val Tyr Val Gln Ala Ala Asn Leu His Leu Ser Ile	
155 160 165 170	
tta agg gat gtt tca gtt ttc gga gaa aga tgg gga tat gat aca gcg	821
Leu Arg Asp Val Ser Val Phe Gly Glu Arg Trp Gly Tyr Asp Thr Ala	
175 180 185	
act atc aat aat cgc tat agt gat ctg act agc ctt att cat gtt tat	869
Thr Ile Asn Asn Arg Tyr Ser Asp Leu Thr Ser Leu Ile His Val Tyr	
190 195 200	
act aac cat tgt gtg gat acg tat aat cag gga tta agg cgt ttg gaa	917
Thr Asn His Cys Val Asp Thr Tyr Asn Gln Gly Leu Arg Arg Leu Glu	
205 210 215	
ggc cgt ttt ctt agc gat tgg att gta tat aat cgt ttc cgg aga caa	965
Gly Arg Phe Leu Ser Asp Trp Ile Val Tyr Asn Arg Phe Arg Arg Gln	
220 225 230	
ttg aca att tca gta tta gat att gtt gcg ttt ttt cca aat tat gat	1013
Leu Thr Ile Ser Val Leu Asp Ile Val Ala Phe Phe Pro Asn Tyr Asp	
235 240 245 250	
att aga aca tat cca att caa aca gct act cag cta acg agg gaa gtc	1061
Ile Arg Thr Tyr Pro Ile Gln Thr Ala Thr Gln Leu Thr Arg Glu Val	
255 260 265	
tat ctg gat tta cct ttt att aat caa aat ctt tct cct gca gca agc	1109
Tyr Leu Asp Leu Pro Phe Ile Asn Gln Asn Leu Ser Pro Ala Ala Ser	
270 275 280	
tat cca acc ttt tca gct gct gaa agt gct ata att aga agt cct cat	1157
Tyr Pro Thr Phe Ser Ala Ala Glu Ser Ala Ile Ile Arg Ser Pro His	
285 290 295	
tta gta gac ttt tta aat agc ttt acc att tat aca gat agt ctg gca	1205
Leu Val Asp Phe Leu Asn Ser Phe Thr Ile Tyr Thr Asp Ser Leu Ala	
300 305 310	

cgt tat gca tat tgg gga ggg cac ttg gta aat tct ttc cgc aca gga	1253
Arg Tyr Ala Tyr Trp Gly Gly His Leu Val Asn Ser Phe Arg Thr Gly	
315 320 325 330	
acc act act aat ttg ata aga tcc cct tta tat gga agg gaa gga aat	1301
Thr Thr Thr Asn Leu Ile Arg Ser Pro Leu Tyr Gly Arg Glu Gly Asn	
335 340 345	
aca gag cgc ccc gta act att acc gca tca cct agc gta cca ata ttt	1349
Thr Glu Arg Pro Val Thr Ile Thr Ala Ser Pro Ser Val Pro Ile Phe	
350 355 360	
aga aca ctt tca tat att aca ggc ctt gac aat tca aat cct gta gct	1397
Arg Thr Leu Ser Tyr Ile Thr Gly Leu Asp Asn Ser Asn Pro Val Ala	
365 370 375	
gga atc gag gga gtg gaa ttc caa aat act ata agt aga agt atc tat	1445
Gly Ile Glu Gly Val Glu Phe Gln Asn Thr Ile Ser Arg Ser Ile Tyr	
380 385 390	
cgt aaa agc ggt cca ata gat tct ttt agt gaa tta cca cct caa gat	1493
Arg Lys Ser Gly Pro Ile Asp Ser Phe Ser Glu Leu Pro Pro Gln Asp	
395 400 405 410	
gcc agc gta tct cct gca att ggg tat agt cac cgt tta tgc cat gca	1541
Ala Ser Val Ser Pro Ala Ile Gly Tyr Ser His Arg Leu Cys His Ala	
415 420 425	
aca ttt tta gaa cgg att agt gga cca aga ata gca ggc acc gta ttt	1589
Thr Phe Leu Glu Arg Ile Ser Gly Pro Arg Ile Ala Gly Thr Val Phe	
430 435 440	
tct tgg aca cac cgt agt gcc agc cct act aat gaa gta agt cca tct	1637
Ser Trp Thr His Arg Ser Ala Ser Pro Thr Asn Glu Val Ser Pro Ser	
445 450 455	
aga att aca caa att cca tgg gta aag gcg cat act ctt gca tct ggt	1685
Arg Ile Thr Gln Ile Pro Trp Val Lys Ala His Thr Leu Ala Ser Gly	
460 465 470	
gcc tcc gtc att aaa ggt cct gga ttt aca ggt gga gat att ctg act	1733
Ala Ser Val Ile Lys Gly Pro Gly Phe Thr Gly Gly Asp Ile Leu Thr	
475 480 485 490	
agg aat agt atg ggc gag ctg ggg acc tta cga gta acc ttc aca gga	1781
Arg Asn Ser Met Gly Glu Leu Gly Thr Leu Arg Val Thr Phe Thr Gly	
495 500 505	
aga tta cca caa agt tat tat ata cgt ttc cgt tat gct tcg gta gca	1829
Arg Leu Pro Gln Ser Tyr Tyr Ile Arg Phe Arg Tyr Ala Ser Val Ala	
510 515 520	

aat agg agt ggt aca ttt aga tat tca cag cca cct tcg tat gga att	1877
Asn Arg Ser Gly Thr Phe Arg Tyr Ser Gln Pro Pro Ser Tyr Gly Ile	
525 530 535	
tca ttt cca aaa act atg gac gca ggt gaa cca cta aca tct cgt tcg	1925
Ser Phe Pro Lys Thr Met Asp Ala Gly Glu Pro Leu Thr Ser Arg Ser	
540 545 550	
ttc gct cat aca aca ctc ttc act cca ata acc ttt tca cga gct caa	1973
Phe Ala His Thr Thr Leu Phe Thr Pro Ile Thr Phe Ser Arg Ala Gln	
555 560 565 570	
gaa gaa ttt gat cta tac atc caa tcg ggt gtt tat ata gat cga att	2021
Glu Glu Phe Asp Leu Tyr Ile Gln Ser Gly Val Tyr Ile Asp Arg Ile	
575 580 585	
gaa ttt ata ccg gtt act gca aca ttt gag gca gaa tat gat tta gaa	2069
Glu Phe Ile Pro Val Thr Ala Thr Phe Glu Ala Glu Tyr Asp Leu Glu	
590 595 600	
aga gcg caa aag gtg gtg aat gcc ctg ttt acg tct aca aac caa cta	2117
Arg Ala Gln Lys Val Val Asn Ala Leu Phe Thr Ser Thr Asn Gln Leu	
605 610 615	
ggg cta aaa aca gat gtg acg gat tat cat att gat cag gta tcc aat	2165
Gly Leu Lys Thr Asp Val Thr Asp Tyr His Ile Asp Gln Val Ser Asn	
620 625 630	
cta gtt gcg tgt tta tcg gat gaa ttt tgt ctg gat gaa aag aga gaa	2213
Leu Val Ala Cys Leu Ser Asp Glu Phe Cys Leu Asp Glu Lys Arg Glu	
635 640 645 650	
ttg tcc gag aaa gtt aaa cat gca aag cga ctc agt gat gag cgg aat	2261
Leu Ser Glu Lys Val Lys His Ala Lys Arg Leu Ser Asp Glu Arg Asn	
655 660 665	
tta ctt caa gat cca aac ttc aga ggg atc aat agg caa cca gac cgt	2309
Leu Leu Gln Asp Pro Asn Phe Arg Gly Ile Asn Arg Gln Pro Asp Arg	
670 675 680	
ggc tgg aga gga agt acg gat att act atc caa gga gga gat gac gta	2357
Gly Trp Arg Gly Ser Thr Asp Ile Thr Ile Gln Gly Gly Asp Asp Val	
685 690 695	
ttc aaa gag aat tac gtt acg cta ccg ggt acc ttt gat gag tgc tat	2405
Phe Lys Glu Asn Tyr Val Thr Leu Pro Gly Thr Phe Asp Glu Cys Tyr	
700 705 710	
cca acg tat tta tat caa aaa ata gat gag tcg aaa tta aaa gcc tat	2453
Pro Thr Tyr Leu Tyr Gln Lys Ile Asp Glu Ser Lys Leu Lys Ala Tyr	
715 720 725 730	

acc cgt tat caa tta aga ggg tat atc gaa gat agt caa gac tta gaa	2501
Thr Arg Tyr Gln Leu Arg Gly Tyr Ile Glu Asp Ser Gln Asp Leu Glu	
735 740 745	
atc tat tta att cgt tac aat gca aaa cac gaa ata gta aat gta cca	2549
Ile Tyr Leu Ile Arg Tyr Asn Ala Lys His Glu Ile Val Asn Val Pro	
750 755 760	
ggg aca gga agt tta tgg cct ctt tct gta gaa aat caa att gga cct	2597
Gly Thr Gly Ser Leu Trp Pro Leu Ser Val Glu Asn Gln Ile Gly Pro	
765 770 775	
tgt gga gaa ccg aat cga tgc gcg cca cac ctt gaa tgg aat cct gat	2645
Cys Gly Glu Pro Asn Arg Cys Ala Pro His Leu Glu Trp Asn Pro Asp	
780 785 790	
tta cac tgt tcc tgc aga gac ggg gaa aaa tgt gca cat cat tct cat	2693
Leu His Cys Ser Cys Arg Asp Gly Glu Lys Cys Ala His His Ser His	
795 800 805 810	
cat ttc tct ttg gac att gat gtt gga tgt aca gac ttaaat gag gac	2741
His Phe Ser Leu Asp Ile Asp Val Gly Cys Thr Asp Leu Asn Glu Asp	
815 820 825	
tta ggt gta tgg gtg ata ttc aag att aag acg caa gat ggc cac gca	2789
Leu Gly Val Trp Val Ile Phe Lys Ile Lys Thr Gln Asp Gly His Ala	
830 835 840	
cga cta ggg aat cta gag ttt ctc gaa gag aaa cca tta tta gga gaa	2837
Arg Leu Gly Asn Leu Glu Phe Leu Glu Glu Lys Pro Leu Leu Gly Glu	
845 850 855	
gca cta gct cgt gtg aaa aga gcg gag aaa aaa tgg aga gac aaa cgc	2885
Ala Leu Ala Arg Val Lys Arg Ala Glu Lys Lys Trp Arg Asp Lys Arg	
860 865 870	
gaa aca tta caa ttg gaa aca act atc gtt tat aaa gag gca aaa gaa	2933
Glu Thr Leu Gln Leu Glu Thr Thr Ile Val Tyr Lys Glu Ala Lys Glu	
875 880 885 890	
tct gta gat gct tta ttt gta aac tct caa tat gat aga tta caa gcg	2981
Ser Val Asp Ala Leu Phe Val Asn Ser Gln Tyr Asp Arg Leu Gln Ala	
895 900 905	
gat acg aac atc gcg atg att cat gcg gca gat aaa cgc gtt cat aga	3029
Asp Thr Asn Ile Ala Met Ile His Ala Ala Asp Lys Arg Val His Arg	
910 915 920	
att cga gaa gcg tat ctg ccg gag ctg tct gtg att ccg ggt gtc aat	3077
Ile Arg Glu Ala Tyr Leu Pro Glu Leu Ser Val Ile Pro Gly Val Asn	
925 930 935	

gcg gct att ttt gaa gaa tta gaa gag cgt att ttc act gca ttt tcc	3125
Ala Ala Ile Phe Glu Glu Leu Glu Glu Arg Ile Phe Thr Ala Phe Ser	
940 945 950	
cta tat gat gcg aga aat att att aaa aat ggc gat ttc aat aat ggc	3173
Leu Tyr Asp Ala Arg Asn Ile Ile Lys Asn Gly Asp Phe Asn Asn Gly	
955 960 965 970	
tta tta tgc tgg aac gtg aaa ggg cat gta gag gta gaa gaa caa aac	3221
Leu Leu Cys Trp Asn Val Lys Gly His Val Glu Val Glu Glu Gln Asn	
975 980 985	
aat cac cgt tca gtc ctg gtt atc cca gaa tgg gag gca gaa gtg tca	3269
Asn His Arg Ser Val Leu Val Ile Pro Glu Trp Glu Ala Glu Val Ser	
990 995 1000	
caa gag gtt cgt gtc tgt cca ggt cgt ggc tat atc ctt cgt gtt aca	3317
Gln Glu Val Arg Val Cys Pro Gly Arg Gly Tyr Ile Leu Arg Val Thr	
1005 1010 1015	
gcg tac aaa gag gga tat gga gaa ggt tgc gta acg atc cat gag atc	3365
Ala Tyr Lys Glu Gly Tyr Gly Glu Gly Cys Val Thr Ile His Glu Ile	
1020 1025 1030	
gag aac aat aca gac gaa ctg aaa ttc aac aac tgt gta gaa gag gaa	3413
Glu Asn Asn Thr Asp Glu Leu Lys Phe Asn Asn Cys Val Glu Glu Glu	
1035 1040 1045 1050	
gta tat cca aac aac acg gta acg tgt att aat tat act gcg act caa	3461
Val Tyr Pro Asn Asn Thr Val Thr Cys Ile Asn Tyr Thr Ala Thr Gln	
1055 1060 1065	
gaa gaa tat gag ggt acg tac act tct cgt aat cga gga tat gac gaa	3509
Glu Glu Tyr Glu Gly Thr Tyr Thr Ser Arg Asn Arg Gly Tyr Asp Glu	
1070 1075 1080	
gcc tat ggt aat aac cct tcc gta cca gct gat tat gcg tca gtc tat	3557
Ala Tyr Gly Asn Asn Pro Ser Val Pro Ala Asp Tyr Ala Ser Val Tyr	
1085 1090 1095	
gaa gaa aaa tcg tat aca gat aga cga aga gag aat cct tgt gaa tct	3605
Glu Glu Lys Ser Tyr Thr Asp Arg Arg Arg Glu Asn Pro Cys Glu Ser	
1100 1105 1110	
aac aga gga tat gga gat tac aca cca cta cca gct ggt tat gta aca	3653
Asn Arg Gly Tyr Gly Asp Tyr Thr Pro Leu Pro Ala Gly Tyr Val Thr	
1115 1120 1125 1130	
aag gaa tta gag tac ttc cca gag acc gat aag gta tgg att gag att	3701
Lys Glu Leu Glu Tyr Phe Pro Glu Thr Asp Lys Val Trp Ile Glu Ile	
1135 1140 1145	

gga gaa aca gaa gga aca ttc atc gtg gac agc gtg gaa tta ctc ctt 3749
 Gly Glu Thr Glu Gly Thr Phe Ile Val Asp Ser Val Glu Leu Leu Leu
 1150 1155 1160

atg gag gaa tag gaccatccga gtatagcagt ttaataaata ttaattaaaa 3801
 Met Glu Glu
 1165

tagtagtcta acttccgttc caattaaata agtaaattac agttgtaaaa aaaaacgaac 3861
 attactcttc aaagagcgat gtcggttttt tatatggtgt gt 3903

<210> 6
 <211> 1165
 <212> PRT
 <213> Bacillus thuringiensis

<400> 6
 Met Glu Ile Asn Asn Gln Asn Gln Cys Val Pro Tyr Asn Cys Leu Ser
 1 5 10 15
 Asn Pro Lys Glu Ile Ile Leu Gly Glu Glu Arg Leu Glu Thr Gly Asn
 20 25 30
 Thr Val Ala Asp Ile Ser Leu Gly Leu Ile Asn Phe Leu Tyr Ser Asn
 35 40 45
 Phe Val Pro Gly Gly Gly Phe Ile Val Gly Leu Leu Glu Leu Ile Trp
 50 55 60
 Gly Phe Ile Gly Pro Ser Gln Trp Asp Ile Phe Leu Ala Gln Ile Glu
 65 70 75 80
 Gln Leu Ile Ser Gln Arg Ile Glu Glu Phe Ala Arg Asn Gln Ala Ile
 85 90 95
 Ser Arg Leu Glu Gly Leu Ser Asn Leu Tyr Lys Val Tyr Val Arg Ala
 100 105 110
 Phe Ser Asp Trp Glu Lys Asp Pro Thr Asn Pro Ala Leu Arg Glu Glu
 115 120 125
 Met Arg Ile Gln Phe Asn Asp Met Asn Ser Ala Leu Ile Thr Ala Ile
 130 135 140
 Pro Leu Phe Arg Val Gln Asn Tyr Glu Val Ala Leu Leu Ser Val Tyr
 145 150 155 160
 Val Gln Ala Ala Asn Leu His Leu Ser Ile Leu Arg Asp Val Ser Val
 165 170 175

Phe	Gly	Glu	Arg	Trp	Gly	Tyr	Asp	Thr	Ala	Thr	Ile	Asn	Asn	Arg	Tyr			
			180					185					190					
Ser	Asp	Leu	Thr	Ser	Leu	Ile	His	Val	Tyr	Thr	Asn	His	Cys	Val	Asp			
		195					200					205						
Thr	Tyr	Asn	Gln	Gly	Leu	Arg	Arg	Leu	Glu	Gly	Arg	Phe	Leu	Ser	Asp			
	210					215					220							
Trp	Ile	Val	Tyr	Asn	Arg	Phe	Arg	Arg	Gln	Leu	Thr	Ile	Ser	Val	Leu			
225					230					235					240			
Asp	Ile	Val	Ala	Phe	Phe	Pro	Asn	Tyr	Asp	Ile	Arg	Thr	Tyr	Pro	Ile			
			245						250					255				
Gln	Thr	Ala	Thr	Gln	Leu	Thr	Arg	Glu	Val	Tyr	Leu	Asp	Leu	Pro	Phe			
		260						265					270					
Ile	Asn	Gln	Asn	Leu	Ser	Pro	Ala	Ala	Ser	Tyr	Pro	Thr	Phe	Ser	Ala			
	275						280					285						
Ala	Glu	Ser	Ala	Ile	Ile	Arg	Ser	Pro	His	Leu	Val	Asp	Phe	Leu	Asn			
	290					295					300							
Ser	Phe	Thr	Ile	Tyr	Thr	Asp	Ser	Leu	Ala	Arg	Tyr	Ala	Tyr	Trp	Gly			
305					310					315					320			
Gly	His	Leu	Val	Asn	Ser	Phe	Arg	Thr	Gly	Thr	Thr	Thr	Asn	Leu	Ile			
			325						330					335				
Arg	Ser	Pro	Leu	Tyr	Gly	Arg	Glu	Gly	Asn	Thr	Glu	Arg	Pro	Val	Thr			
		340						345					350					
Ile	Thr	Ala	Ser	Pro	Ser	Val	Pro	Ile	Phe	Arg	Thr	Leu	Ser	Tyr	Ile			
	355						360					365						
Thr	Gly	Leu	Asp	Asn	Ser	Asn	Pro	Val	Ala	Gly	Ile	Glu	Gly	Val	Glu			
	370					375					380							
Phe	Gln	Asn	Thr	Ile	Ser	Arg	Ser	Ile	Tyr	Arg	Lys	Ser	Gly	Pro	Ile			
385					390					395				400				
Asp	Ser	Phe	Ser	Glu	Leu	Pro	Pro	Gln	Asp	Ala	Ser	Val	Ser	Pro	Ala			
			405						410					415				
Ile	Gly	Tyr	Ser	His	Arg	Leu	Cys	His	Ala	Thr	Phe	Leu	Glu	Arg	Ile			
		420						425					430					
Ser	Gly	Pro	Arg	Ile	Ala	Gly	Thr	Val	Phe	Ser	Trp	Thr	His	Arg	Ser			
		435					440						445					

Ala	Ser	Pro	Thr	Asn	Glu	Val	Ser	Pro	Ser	Arg	Ile	Thr	Gln	Ile	Pro
450						455					460				
Trp	Val	Lys	Ala	His	Thr	Leu	Ala	Ser	Gly	Ala	Ser	Val	Ile	Lys	Gly
465					470					475					480
Pro	Gly	Phe	Thr	Gly	Gly	Asp	Ile	Leu	Thr	Arg	Asn	Ser	Met	Gly	Glu
				485					490					495	
Leu	Gly	Thr	Leu	Arg	Val	Thr	Phe	Thr	Gly	Arg	Leu	Pro	Gln	Ser	Tyr
			500					505					510		
Tyr	Ile	Arg	Phe	Arg	Tyr	Ala	Ser	Val	Ala	Asn	Arg	Ser	Gly	Thr	Phe
		515					520					525			
Arg	Tyr	Ser	Gln	Pro	Pro	Ser	Tyr	Gly	Ile	Ser	Phe	Pro	Lys	Thr	Met
	530					535					540				
Asp	Ala	Gly	Glu	Pro	Leu	Thr	Ser	Arg	Ser	Phe	Ala	His	Thr	Thr	Leu
545					550					555					560
Phe	Thr	Pro	Ile	Thr	Phe	Ser	Arg	Ala	Gln	Glu	Glu	Phe	Asp	Leu	Tyr
				565					570					575	
Ile	Gln	Ser	Gly	Val	Tyr	Ile	Asp	Arg	Ile	Glu	Phe	Ile	Pro	Val	Thr
			580					585					590		
Ala	Thr	Phe	Glu	Ala	Glu	Tyr	Asp	Leu	Glu	Arg	Ala	Gln	Lys	Val	Val
		595					600					605			
Asn	Ala	Leu	Phe	Thr	Ser	Thr	Asn	Gln	Leu	Gly	Leu	Lys	Thr	Asp	Val
	610					615					620				
Thr	Asp	Tyr	His	Ile	Asp	Gln	Val	Ser	Asn	Leu	Val	Ala	Cys	Leu	Ser
625					630					635					640
Asp	Glu	Phe	Cys	Leu	Asp	Glu	Lys	Arg	Glu	Leu	Ser	Glu	Lys	Val	Lys
				645					650					655	
His	Ala	Lys	Arg	Leu	Ser	Asp	Glu	Arg	Asn	Leu	Leu	Gln	Asp	Pro	Asn
			660					665					670		
Phe	Arg	Gly	Ile	Asn	Arg	Gln	Pro	Asp	Arg	Gly	Trp	Arg	Gly	Ser	Thr
		675					680					685			
Asp	Ile	Thr	Ile	Gln	Gly	Gly	Asp	Asp	Val	Phe	Lys	Glu	Asn	Tyr	Val
	690					695					700				
Thr	Leu	Pro	Gly	Thr	Phe	Asp	Glu	Cys	Tyr	Pro	Thr	Tyr	Leu	Tyr	Gln
705					710					715					720

Lys	Ile	Asp	Glu	Ser	Lys	Leu	Lys	Ala	Tyr	Thr	Arg	Tyr	Gln	Leu	Arg	725	730	735
Gly	Tyr	Ile	Glu	Asp	Ser	Gln	Asp	Leu	Glu	Ile	Tyr	Leu	Ile	Arg	Tyr	740	745	750
Asn	Ala	Lys	His	Glu	Ile	Val	Asn	Val	Pro	Gly	Thr	Gly	Ser	Leu	Trp	755	760	765
Pro	Leu	Ser	Val	Glu	Asn	Gln	Ile	Gly	Pro	Cys	Gly	Glu	Pro	Asn	Arg	770	775	780
Cys	Ala	Pro	His	Leu	Glu	Trp	Asn	Pro	Asp	Leu	His	Cys	Ser	Cys	Arg	785	790	795
Asp	Gly	Glu	Lys	Cys	Ala	His	His	Ser	His	His	Phe	Ser	Leu	Asp	Ile	805	810	815
Asp	Val	Gly	Cys	Thr	Asp	Leu	Asn	Glu	Asp	Leu	Gly	Val	Trp	Val	Ile	820	825	830
Phe	Lys	Ile	Lys	Thr	Gln	Asp	Gly	His	Ala	Arg	Leu	Gly	Asn	Leu	Glu	835	840	845
Phe	Leu	Glu	Glu	Lys	Pro	Leu	Leu	Gly	Glu	Ala	Leu	Ala	Arg	Val	Lys	850	855	860
Arg	Ala	Glu	Lys	Lys	Trp	Arg	Asp	Lys	Arg	Glu	Thr	Leu	Gln	Leu	Glu	865	870	875
Thr	Thr	Ile	Val	Tyr	Lys	Glu	Ala	Lys	Glu	Ser	Val	Asp	Ala	Leu	Phe	885	890	895
Val	Asn	Ser	Gln	Tyr	Asp	Arg	Leu	Gln	Ala	Asp	Thr	Asn	Ile	Ala	Met	900	905	910
Ile	His	Ala	Ala	Asp	Lys	Arg	Val	His	Arg	Ile	Arg	Glu	Ala	Tyr	Leu	915	920	925
Pro	Glu	Leu	Ser	Val	Ile	Pro	Gly	Val	Asn	Ala	Ala	Ile	Phe	Glu	Glu	930	935	940
Leu	Glu	Glu	Arg	Ile	Phe	Thr	Ala	Phe	Ser	Leu	Tyr	Asp	Ala	Arg	Asn	945	950	955
Ile	Ile	Lys	Asn	Gly	Asp	Phe	Asn	Asn	Gly	Leu	Leu	Cys	Trp	Asn	Val	965	970	975
Lys	Gly	His	Val	Glu	Val	Glu	Glu	Gln	Asn	Asn	His	Arg	Ser	Val	Leu	980	985	990

Val Ile Pro Glu Trp Glu Ala Glu Val Ser Gln Glu Val Arg Val Cys
 995 1000 1005
 Pro Gly Arg Gly Tyr Ile Leu Arg Val Thr Ala Tyr Lys Glu Gly Tyr
 1010 1015 1020
 Gly Glu Gly Cys Val Thr Ile His Glu Ile Glu Asn Asn Thr Asp Glu
 025 1030 1035 1040
 Leu Lys Phe Asn Asn Cys Val Glu Glu Glu Val Tyr Pro Asn Asn Thr
 1045 1050 1055
 Val Thr Cys Ile Asn Tyr Thr Ala Thr Gln Glu Glu Tyr Glu Gly Thr
 1060 1065 1070
 Tyr Thr Ser Arg Asn Arg Gly Tyr Asp Glu Ala Tyr Gly Asn Asn Pro
 1075 1080 1085
 Ser Val Pro Ala Asp Tyr Ala Ser Val Tyr Glu Glu Lys Ser Tyr Thr
 1090 1095 1100
 Asp Arg Arg Arg Glu Asn Pro Cys Glu Ser Asn Arg Gly Tyr Gly Asp
 105 1110 1115 1120
 Tyr Thr Pro Leu Pro Ala Gly Tyr Val Thr Lys Glu Leu Glu Tyr Phe
 1125 1130 1135
 Pro Glu Thr Asp Lys Val Trp Ile Glu Ile Gly Glu Thr Glu Gly Thr
 1140 1145 1150
 Phe Ile Val Asp Ser Val Glu Leu Leu Leu Met Glu Glu
 1155 1160 1165

<210> 7
 <211> 3923
 <212> DNA
 <213> *Bacillus thuringiensis*

<220>
 <221> CDS
 <222> (234) .. (3803)

<400> 7
 aatagaatct caaatctcga tgactgctta gtcttttttaa tactgtctac ttgacagggg 60
 taggaacata atcgggtcaat tttaaatatg gggcatatat tgatatttta taaaatttgt 120
 tacgtttttt gtattttttc ataagatgtg tcatatgtat taaatcgtgg taatgaaaaa 180
 cagtatcaaa ctatcagaac tttggtagtt taataaaaaa acggaggtat ttt atg 236

Met
 1

gag gaa aat aat caa aat caa tgc ata cct tac aat tgt tta agt aat	284
Glu Glu Asn Asn Gln Asn Gln Cys Ile Pro Tyr Asn Cys Leu Ser Asn	
5 10 15	
cct gaa gaa gta ctt ttg gat gga gaa cgg ata tca act ggt aat tca	332
Pro Glu Glu Val Leu Leu Asp Gly Glu Arg Ile Ser Thr Gly Asn Ser	
20 25 30	
tca att gat att tct ctg tca ctt gtt cag ttt atg gta tct aac ttt	380
Ser Ile Asp Ile Ser Leu Ser Leu Val Gln Phe Met Val Ser Asn Phe	
35 40 45	
gta cca ggg gga gga ttt tta gtt gga tta ata gat ttt gta tgg gga	428
Val Pro Gly Gly Gly Phe Leu Val Gly Leu Ile Asp Phe Val Trp Gly	
50 55 60 65	
ata gtt ggc cct tct caa tgg gat gca ttt cta gta caa att gaa caa	476
Ile Val Gly Pro Ser Gln Trp Asp Ala Phe Leu Val Gln Ile Glu Gln	
70 75 80	
tta att aat gaa aga ata gct gaa ttt gct agg aat gct gct att gct	524
Leu Ile Asn Glu Arg Ile Ala Glu Phe Ala Arg Asn Ala Ala Ile Ala	
85 90 95	
aat tta gaa gga tta gaa aac aat tta aat ata tat gtg gaa gca ttt	572
Asn Leu Glu Gly Leu Glu Asn Asn Leu Asn Ile Tyr Val Glu Ala Phe	
100 105 110	
aaa gaa tgg gaa gaa gat cct aat aat cca gaa acc agg acc aga gta	620
Lys Glu Trp Glu Glu Asp Pro Asn Asn Pro Glu Thr Arg Thr Arg Val	
115 120 125	
att gat cgc ttt cgt ata ctt gat ggg cta ctt gaa agg gac att cct	668
Ile Asp Arg Phe Arg Ile Leu Asp Gly Leu Leu Glu Arg Asp Ile Pro	
130 135 140 145	
tcg ttt cga att tct gga ttt gaa gta ccc ctt tta tcc gtt tat gct	716
Ser Phe Arg Ile Ser Gly Phe Glu Val Pro Leu Leu Ser Val Tyr Ala	
150 155 160	
caa gcg gcc aat ctg cat cta gct ata tta aga gat tct gta att ttt	764
Gln Ala Ala Asn Leu His Leu Ala Ile Leu Arg Asp Ser Val Ile Phe	
165 170 175	
gga gaa aga tgg gga ttg aca acg ata aat gtc aat gaa aac tat aat	812
Gly Glu Arg Trp Gly Leu Thr Thr Ile Asn Val Asn Glu Asn Tyr Asn	
180 185 190	
aga cta att agg cat att gat gaa tat gct gat cac tgt gca aat acg	860
Arg Leu Ile Arg His Ile Asp Glu Tyr Ala Asp His Cys Ala Asn Thr	
195 200 205	

tat aat cgg gga tta aat aat tta ccg aaa tct acg tat caa gat tgg	908
Tyr Asn Arg Gly Leu Asn Asn Leu Pro Lys Ser Thr Tyr Gln Asp Trp	
210 215 220 225	
ata aca tat aat cga tta cgg aga gac tta aca ttg act gta tta gat	956
Ile Thr Tyr Asn Arg Leu Arg Arg Asp Leu Thr Leu Thr Val Leu Asp	
230 235 240	
atc gcc gct ttc ttt cca aac tat gac aat agg aga tat cca att cag	1004
Ile Ala Ala Phe Phe Pro Asn Tyr Asp Asn Arg Arg Tyr Pro Ile Gln	
245 250 255	
cca gtt ggt caa cta aca agg gaa gtt tat acg gac cca tta att aat	1052
Pro Val Gly Gln Leu Thr Arg Glu Val Tyr Thr Asp Pro Leu Ile Asn	
260 265 270	
ttt aat cca cag tta cag tct gta gct caa tta cct act ttt aac gtt	1100
Phe Asn Pro Gln Leu Gln Ser Val Ala Gln Leu Pro Thr Phe Asn Val	
275 280 285	
atg gag agc agc gca att aga aat cct cat tta ttt gat ata ttg aat	1148
Met Glu Ser Ser Ala Ile Arg Asn Pro His Leu Phe Asp Ile Leu Asn	
290 295 300 305	
aat ctt aca atc ttt acg gat tgg ttt agt gtt gga cgc aat ttt tat	1196
Asn Leu Thr Ile Phe Thr Asp Trp Phe Ser Val Gly Arg Asn Phe Tyr	
310 315 320	
tgg gga gga cat cga gta ata tct agc ctt ata gga ggt ggt aac ata	1244
Trp Gly Gly His Arg Val Ile Ser Ser Leu Ile Gly Gly Gly Asn Ile	
325 330 335	
aca tct cct ata tat gga aga gag gcg aac cag gag cct cca aga tcc	1292
Thr Ser Pro Ile Tyr Gly Arg Glu Ala Asn Gln Glu Pro Pro Arg Ser	
340 345 350	
ttt act ttt aat gga ccg gta ttt agg act tta tca aat cct act tta	1340
Phe Thr Phe Asn Gly Pro Val Phe Arg Thr Leu Ser Asn Pro Thr Leu	
355 360 365	
cga tta tta cag caa cct tgg cca gcg cca cca ttt aat tta cgt ggt	1388
Arg Leu Leu Gln Gln Pro Trp Pro Ala Pro Pro Phe Asn Leu Arg Gly	
370 375 380 385	
gtt gaa gga gta gaa ttt tct aca cct aca aat agc ttt acg tat cga	1436
Val Glu Gly Val Glu Phe Ser Thr Pro Thr Asn Ser Phe Thr Tyr Arg	
390 395 400	
gga aga ggt acg gtt gat tct tta act gaa tta ccg cct gag gat aat	1484
Gly Arg Gly Thr Val Asp Ser Leu Thr Glu Leu Pro Pro Glu Asp Asn	
405 410 415	

agt gtg cca cct cgc gaa gga tat agt cat cgt tta tgt cat gca act	1532
Ser Val Pro Pro Arg Glu Gly Tyr Ser His Arg Leu Cys His Ala Thr	
420 425 430	
ttt gtt caa aga tct gga aca cct ttt tta aca act ggt gta gta ttt	1580
Phe Val Gln Arg Ser Gly Thr Pro Phe Leu Thr Thr Gly Val Val Phe	
435 440 445	
tct tgg acg cat cgt agt gca act ctt aca aat aca att gat cca gag	1628
Ser Trp Thr His Arg Ser Ala Thr Leu Thr Asn Thr Ile Asp Pro Glu	
450 455 460 465	
aga att aat caa ata cct tta gtg aaa gga ttt aga gtt tgg ggg ggc	1676
Arg Ile Asn Gln Ile Pro Leu Val Lys Gly Phe Arg Val Trp Gly Gly	
470 475 480	
acc tct gtc att aca gga cca gga ttt aca gga ggg gat atc ctt cga	1724
Thr Ser Val Ile Thr Gly Pro Gly Phe Thr Gly Gly Asp Ile Leu Arg	
485 490 495	
aga aat acc ttt ggt gat ttt gta tct cta caa gtc aat att aat tca	1772
Arg Asn Thr Phe Gly Asp Phe Val Ser Leu Gln Val Asn Ile Asn Ser	
500 505 510	
cca att acc caa aga tac cgt tta aga ttt cgt tac gct tcc agt agg	1820
Pro Ile Thr Gln Arg Tyr Arg Leu Arg Phe Arg Tyr Ala Ser Ser Arg	
515 520 525	
gat gca cga gtt ata gta tta aca gga gcg gca tcc aca gga gtg gga	1868
Asp Ala Arg Val Ile Val Leu Thr Gly Ala Ala Ser Thr Gly Val Gly	
530 535 540 545	
ggc caa gtt agt gta aat atg cct ctt cag aaa act atg gaa ata ggg	1916
Gly Gln Val Ser Val Asn Met Pro Leu Gln Lys Thr Met Glu Ile Gly	
550 555 560	
gag aac tta aca tct aga aca ttt aga tat acc gat ttt agt aat cct	1964
Glu Asn Leu Thr Ser Arg Thr Phe Arg Tyr Thr Asp Phe Ser Asn Pro	
565 570 575	
ttt tca ttt aga gct aat cca gat ata att ggg ata agt gaa caa cct	2012
Phe Ser Phe Arg Ala Asn Pro Asp Ile Ile Gly Ile Ser Glu Gln Pro	
580 585 590	
cta ttt ggt gca ggt tct att agt agc ggt gaa ctt tat ata gat aaa	2060
Leu Phe Gly Ala Gly Ser Ile Ser Ser Gly Glu Leu Tyr Ile Asp Lys	
595 600 605	
att gaa att att cta gca gat gca aca ttt gaa gca gaa tct gat tta	2108
Ile Glu Ile Ile Leu Ala Asp Ala Thr Phe Glu Ala Glu Ser Asp Leu	
610 615 620 625	

gaa aga gca caa aag gcg gtg aat gcc ctg ttt act tct tcc aat caa	2156
Glu Arg Ala Gln Lys Ala Val Asn Ala Leu Phe Thr Ser Ser Asn Gln	
630 635 640	
atc ggg tta aaa acc gat gtg acg gat tat cat att gat caa gta tcc	2204
Ile Gly Leu Lys Thr Asp Val Thr Asp Tyr His Ile Asp Gln Val Ser	
645 650 655	
aat tta gtg gat tgt tta tca gat gaa ttt tgt ctg gat gaa aag cga	2252
Asn Leu Val Asp Cys Leu Ser Asp Glu Phe Cys Leu Asp Glu Lys Arg	
660 665 670	
gaa ttg tcc gag aaa gtc aaa cat gcg aag cga ctc agt gat gag cgg	2300
Glu Leu Ser Glu Lys Val Lys His Ala Lys Arg Leu Ser Asp Glu Arg	
675 680 685	
aat tta ctt caa gat cca aac ttc aga ggg atc aat aga caa cca gac	2348
Asn Leu Leu Gln Asp Pro Asn Phe Arg Gly Ile Asn Arg Gln Pro Asp	
690 695 700 705	
cgt ggc tgg aga gga agt aca gat att acc atc caa gga gga gat gac	2396
Arg Gly Trp Arg Gly Ser Thr Asp Ile Thr Ile Gln Gly Gly Asp Asp	
710 715 720	
gta ttc aaa gag aat tac gtc aca cta ccg ggt acc gtt gat gag tgc	2444
Val Phe Lys Glu Asn Tyr Val Thr Leu Pro Gly Thr Val Asp Glu Cys	
725 730 735	
tat cca acg tat tta tat cag aaa ata gat gag tgc aaa tta aaa gct	2492
Tyr Pro Thr Tyr Leu Tyr Gln Lys Ile Asp Glu Ser Lys Leu Lys Ala	
740 745 750	
tat acc cgt tat gaa tta aga ggg tat atc gaa gat agt caa gac tta	2540
Tyr Thr Arg Tyr Glu Leu Arg Gly Tyr Ile Glu Asp Ser Gln Asp Leu	
755 760 765	
gaa atc tat ttg atc cgt tac aat gca aaa cac gaa ata gta aat gtg	2588
Glu Ile Tyr Leu Ile Arg Tyr Asn Ala Lys His Glu Ile Val Asn Val	
770 775 780 785	
cca ggc acg ggt tcc tta tgg ccg ctt tca gcc caa agt cca atc gga	2636
Pro Gly Thr Gly Ser Leu Trp Pro Leu Ser Ala Gln Ser Pro Ile Gly	
790 795 800	
aag tgt gga gaa ccg aat cga tgc gcg cca cac ctt gaa tgg aat cct	2684
Lys Cys Gly Glu Pro Asn Arg Cys Ala Pro His Leu Glu Trp Asn Pro	
805 810 815	
gat cta gat tgt tcc tgc aga gac ggg gaa aaa tgt gca cat cat tcc	2732
Asp Leu Asp Cys Ser Cys Arg Asp Gly Glu Lys Cys Ala His His Ser	
820 825 830	

cat cat ttc acc ttg gat att gat gtt gga tgt aca gac tta aat gag	2780
His His Phe Thr Leu Asp Ile Asp Val Gly Cys Thr Asp Leu Asn Glu	
835 840 845	
gac tta ggt gta tgg gtg ata ttc aag att aag acg caa gat ggc cat	2828
Asp Leu Gly Val Trp Val Ile Phe Lys Ile Lys Thr Gln Asp Gly His	
850 855 860 865	
gca aga cta ggg aat cta gag ttt ctc gaa gag aaa cca tta tta ggg	2876
Ala Arg Leu Gly Asn Leu Glu Phe Leu Glu Glu Lys Pro Leu Leu Gly	
870 875 880	
gaa gca cta gct cgt gtg aaa aga gcg gag aag aag tgg aga gac aaa	2924
Glu Ala Leu Ala Arg Val Lys Arg Ala Glu Lys Lys Trp Arg Asp Lys	
885 890 895	
cga gag aaa ctg cag ttg gaa aca aat att gtt tat aaa gag gca aaa	2972
Arg Glu Lys Leu Gln Leu Glu Thr Asn Ile Val Tyr Lys Glu Ala Lys	
900 905 910	
gaa tct gta gat gct tta ttt gta aac tct caa tat gat aga tta caa	3020
Glu Ser Val Asp Ala Leu Phe Val Asn Ser Gln Tyr Asp Arg Leu Gln	
915 920 925	
gtg gat acg aac atc gcg atg att cat gcg gca gat aaa cgc gtt cat	3068
Val Asp Thr Asn Ile Ala Met Ile His Ala Ala Asp Lys Arg Val His	
930 935 940 945	
aga atc cgg gaa gcg tat ctg cca gag ttg tct gtg att cca ggt gtc	3116
Arg Ile Arg Glu Ala Tyr Leu Pro Glu Leu Ser Val Ile Pro Gly Val	
950 955 960	
aat gcg gcc att ttc gaa gaa tta gag gga cgt att ttt aca gcg tat	3164
Asn Ala Ala Ile Phe Glu Glu Leu Glu Gly Arg Ile Phe Thr Ala Tyr	
965 970 975	
tcc tta tat gat gcg aga aat gtc att aaa aat ggc gat ttc aat aat	3212
Ser Leu Tyr Asp Ala Arg Asn Val Ile Lys Asn Gly Asp Phe Asn Asn	
980 985 990	
ggc tta tta tgc tgg aac gtg aaa ggt cat gta gat gta gaa gag caa	3260
Gly Leu Leu Cys Trp Asn Val Lys Gly His Val Asp Val Glu Glu Gln	
995 1000 1005	
aac aac cac cgt tcg gtc ctt gtt atc cca gaa tgg gag gca gaa gtg	3308
Asn Asn His Arg Ser Val Leu Val Ile Pro Glu Trp Glu Ala Glu Val	
1010 1015 1020 1025	
tca caa gag gtt cgt gtc tgt cca ggt cgt ggc tat atc ctt cgt gtc	3356
Ser Gln Glu Val Arg Val Cys Pro Gly Arg Gly Tyr Ile Leu Arg Val	
1030 1035 1040	

aca gca tat aaa gag gga tat gga gag ggc tgc gta acg atc cat gag 3404
 Thr Ala Tyr Lys Glu Gly Tyr Gly Glu Gly Cys Val Thr Ile His Glu
 1045 1050 1055
 atc gaa gac aat aca gac gaa ctg aaa ttc agc aac tgt gta gaa gag 3452
 Ile Glu Asp Asn Thr Asp Glu Leu Lys Phe Ser Asn Cys Val Glu Glu
 1060 1065 1070
 gaa gta tat cca aac aac aca gta acg tgt aat aat tat act ggg act 3500
 Glu Val Tyr Pro Asn Asn Thr Val Thr Cys Asn Asn Tyr Thr Gly Thr
 1075 1080 1085
 caa gaa gaa tat gag ggt acg tac act tct cgt aat caa gga tat gac 3548
 Gln Glu Glu Tyr Glu Gly Thr Tyr Thr Ser Arg Asn Gln Gly Tyr Asp
 1090 1095 1100 1105
 gaa gcc tat ggt aat aac cct tcc gta cca gct gat tac gct tca gtc 3596
 Glu Ala Tyr Gly Asn Asn Pro Ser Val Pro Ala Asp Tyr Ala Ser Val
 1110 1115 1120
 tat gaa gaa aaa tcg tat aca gat gga cga aga gag aat cct tgt gaa 3644
 Tyr Glu Glu Lys Ser Tyr Thr Asp Gly Arg Arg Glu Asn Pro Cys Glu
 1125 1130 1135
 tct aac aga ggc tat ggg gat tac aca cca cta ccg gct ggt tat gta 3692
 Ser Asn Arg Gly Tyr Gly Asp Tyr Thr Pro Leu Pro Ala Gly Tyr Val
 1140 1145 1150
 aca aag gat tta gag tac ttc cca gag acc gat aag gta tgg att gag 3740
 Thr Lys Asp Leu Glu Tyr Phe Pro Glu Thr Asp Lys Val Trp Ile Glu
 1155 1160 1165
 atc gga gaa aca gaa gga aca ttc atc gtg gat agc gtg gaa tta ctc 3788
 Ile Gly Glu Thr Glu Gly Thr Phe Ile Val Asp Ser Val Glu Leu Leu
 1170 1175 1180 1185
 ctt atg gag gaa taa gatacgttat aaaatgtaac gtatgcaaataaagaatgat 3843
 Leu Met Glu Glu
 1190
 tactgaccta tattaacaga taaataagaa aattttttata cgaataaaaa acggacatca 3903
 ctcttaagag aatgatgtcc 3923

<210> 8
 <211> 1189
 <212> PRT
 <213> Bacillus thuringiensis

<400> 8

Met	Glu	Glu	Asn	Asn	Gln	Asn	Gln	Cys	Ile	Pro	Tyr	Asn	Cys	Leu	Ser	
1				5				10						15		
Asn	Pro	Glu	Glu	Val	Leu	Leu	Asp	Gly	Glu	Arg	Ile	Ser	Thr	Gly	Asn	
			20					25					30			
Ser	Ser	Ile	Asp	Ile	Ser	Leu	Ser	Leu	Val	Gln	Phe	Met	Val	Ser	Asn	
		35					40					45				
Phe	Val	Pro	Gly	Gly	Gly	Phe	Leu	Val	Gly	Leu	Ile	Asp	Phe	Val	Trp	
	50					55					60					
Gly	Ile	Val	Gly	Pro	Ser	Gln	Trp	Asp	Ala	Phe	Leu	Val	Gln	Ile	Glu	
65					70				75						80	
Gln	Leu	Ile	Asn	Glu	Arg	Ile	Ala	Glu	Phe	Ala	Arg	Asn	Ala	Ala	Ile	
			85					90						95		
Ala	Asn	Leu	Glu	Gly	Leu	Glu	Asn	Asn	Leu	Asn	Ile	Tyr	Val	Glu	Ala	
		100					105						110			
Phe	Lys	Glu	Trp	Glu	Glu	Asp	Pro	Asn	Asn	Pro	Glu	Thr	Arg	Thr	Arg	
	115						120					125				
Val	Ile	Asp	Arg	Phe	Arg	Ile	Leu	Asp	Gly	Leu	Leu	Glu	Arg	Asp	Ile	
	130					135				140						
Pro	Ser	Phe	Arg	Ile	Ser	Gly	Phe	Glu	Val	Pro	Leu	Leu	Ser	Val	Tyr	
145					150					155					160	
Ala	Gln	Ala	Ala	Asn	Leu	His	Leu	Ala	Ile	Leu	Arg	Asp	Ser	Val	Ile	
			165					170						175		
Phe	Gly	Glu	Arg	Trp	Gly	Leu	Thr	Thr	Ile	Asn	Val	Asn	Glu	Asn	Tyr	
		180						185					190			
Asn	Arg	Leu	Ile	Arg	His	Ile	Asp	Glu	Tyr	Ala	Asp	His	Cys	Ala	Asn	
	195						200					205				
Thr	Tyr	Asn	Arg	Gly	Leu	Asn	Asn	Leu	Pro	Lys	Ser	Thr	Tyr	Gln	Asp	
	210					215					220					
Trp	Ile	Thr	Tyr	Asn	Arg	Leu	Arg	Arg	Asp	Leu	Thr	Leu	Thr	Val	Leu	
225					230					235					240	
Asp	Ile	Ala	Ala	Phe	Phe	Pro	Asn	Tyr	Asp	Asn	Arg	Arg	Tyr	Pro	Ile	
			245						250					255		
Gln	Pro	Val	Gly	Gln	Leu	Thr	Arg	Glu	Val	Tyr	Thr	Asp	Pro	Leu	Ile	
		260						265					270			

Asn	Phe	Asn	Pro	Gln	Leu	Gln	Ser	Val	Ala	Gln	Leu	Pro	Thr	Phe	Asn	
		275					280					285				
Val	Met	Glu	Ser	Ser	Ala	Ile	Arg	Asn	Pro	His	Leu	Phe	Asp	Ile	Leu	
	290					295					300					
Asn	Asn	Leu	Thr	Ile	Phe	Thr	Asp	Trp	Phe	Ser	Val	Gly	Arg	Asn	Phe	
305					310					315					320	
Tyr	Trp	Gly	Gly	His	Arg	Val	Ile	Ser	Ser	Leu	Ile	Gly	Gly	Gly	Asn	
				325					330					335		
Ile	Thr	Ser	Pro	Ile	Tyr	Gly	Arg	Glu	Ala	Asn	Gln	Glu	Pro	Pro	Arg	
			340					345					350			
Ser	Phe	Thr	Phe	Asn	Gly	Pro	Val	Phe	Arg	Thr	Leu	Ser	Asn	Pro	Thr	
		355					360					365				
Leu	Arg	Leu	Leu	Gln	Gln	Pro	Trp	Pro	Ala	Pro	Pro	Phe	Asn	Leu	Arg	
	370					375					380					
Gly	Val	Glu	Gly	Val	Glu	Phe	Ser	Thr	Pro	Thr	Asn	Ser	Phe	Thr	Tyr	
385					390					395					400	
Arg	Gly	Arg	Gly	Thr	Val	Asp	Ser	Leu	Thr	Glu	Leu	Pro	Pro	Glu	Asp	
				405					410					415		
Asn	Ser	Val	Pro	Pro	Arg	Glu	Gly	Tyr	Ser	His	Arg	Leu	Cys	His	Ala	
		420						425					430			
Thr	Phe	Val	Gln	Arg	Ser	Gly	Thr	Pro	Phe	Leu	Thr	Thr	Gly	Val	Val	
	435						440					445				
Phe	Ser	Trp	Thr	His	Arg	Ser	Ala	Thr	Leu	Thr	Asn	Thr	Ile	Asp	Pro	
	450					455					460					
Glu	Arg	Ile	Asn	Gln	Ile	Pro	Leu	Val	Lys	Gly	Phe	Arg	Val	Trp	Gly	
465					470					475					480	
Gly	Thr	Ser	Val	Ile	Thr	Gly	Pro	Gly	Phe	Thr	Gly	Gly	Asp	Ile	Leu	
				485					490					495		
Arg	Arg	Asn	Thr	Phe	Gly	Asp	Phe	Val	Ser	Leu	Gln	Val	Asn	Ile	Asn	
		500						505					510			
Ser	Pro	Ile	Thr	Gln	Arg	Tyr	Arg	Leu	Arg	Phe	Arg	Tyr	Ala	Ser	Ser	
		515					520					525				
Arg	Asp	Ala	Arg	Val	Ile	Val	Leu	Thr	Gly	Ala	Ala	Ser	Thr	Gly	Val	
	530					535					540					

Gly	Gly	Gln	Val	Ser	Val	Asn	Met	Pro	Leu	Gln	Lys	Thr	Met	Glu	Ile	545	550	555	560
Gly	Glu	Asn	Leu	Thr	Ser	Arg	Thr	Phe	Arg	Tyr	Thr	Asp	Phe	Ser	Asn	565	570	575	
Pro	Phe	Ser	Phe	Arg	Ala	Asn	Pro	Asp	Ile	Ile	Gly	Ile	Ser	Glu	Gln	580	585	590	
Pro	Leu	Phe	Gly	Ala	Gly	Ser	Ile	Ser	Ser	Gly	Glu	Leu	Tyr	Ile	Asp	595	600	605	
Lys	Ile	Glu	Ile	Ile	Leu	Ala	Asp	Ala	Thr	Phe	Glu	Ala	Glu	Ser	Asp	610	615	620	
Leu	Glu	Arg	Ala	Gln	Lys	Ala	Val	Asn	Ala	Leu	Phe	Thr	Ser	Ser	Asn	625	630	635	640
Gln	Ile	Gly	Leu	Lys	Thr	Asp	Val	Thr	Asp	Tyr	His	Ile	Asp	Gln	Val	645	650	655	
Ser	Asn	Leu	Val	Asp	Cys	Leu	Ser	Asp	Glu	Phe	Cys	Leu	Asp	Glu	Lys	660	665	670	
Arg	Glu	Leu	Ser	Glu	Lys	Val	Lys	His	Ala	Lys	Arg	Leu	Ser	Asp	Glu	675	680	685	
Arg	Asn	Leu	Leu	Gln	Asp	Pro	Asn	Phe	Arg	Gly	Ile	Asn	Arg	Gln	Pro	690	695	700	
Asp	Arg	Gly	Trp	Arg	Gly	Ser	Thr	Asp	Ile	Thr	Ile	Gln	Gly	Gly	Asp	705	710	715	720
Asp	Val	Phe	Lys	Glu	Asn	Tyr	Val	Thr	Leu	Pro	Gly	Thr	Val	Asp	Glu	725	730	735	
Cys	Tyr	Pro	Thr	Tyr	Leu	Tyr	Gln	Lys	Ile	Asp	Glu	Ser	Lys	Leu	Lys	740	745	750	
Ala	Tyr	Thr	Arg	Tyr	Glu	Leu	Arg	Gly	Tyr	Ile	Glu	Asp	Ser	Gln	Asp	755	760	765	
Leu	Glu	Ile	Tyr	Leu	Ile	Arg	Tyr	Asn	Ala	Lys	His	Glu	Ile	Val	Asn	770	775	780	
Val	Pro	Gly	Thr	Gly	Ser	Leu	Trp	Pro	Leu	Ser	Ala	Gln	Ser	Pro	Ile	785	790	795	800
Gly	Lys	Cys	Gly	Glu	Pro	Asn	Arg	Cys	Ala	Pro	His	Leu	Glu	Trp	Asn	805	810	815	

Pro	Asp	Leu	Asp	Cys	Ser	Cys	Arg	Asp	Gly	Glu	Lys	Cys	Ala	His	His		
			820						825					830			
Ser	His	His	Phe	Thr	Leu	Asp	Ile	Asp	Val	Gly	Cys	Thr	Asp	Leu	Asn		
		835					840					845					
Glu	Asp	Leu	Gly	Val	Trp	Val	Ile	Phe	Lys	Ile	Lys	Thr	Gln	Asp	Gly		
	850					855					860						
His	Ala	Arg	Leu	Gly	Asn	Leu	Glu	Phe	Leu	Glu	Glu	Lys	Pro	Leu	Leu		
865					870					875					880		
Gly	Glu	Ala	Leu	Ala	Arg	Val	Lys	Arg	Ala	Glu	Lys	Lys	Trp	Arg	Asp		
			885						890					895			
Lys	Arg	Glu	Lys	Leu	Gln	Leu	Glu	Thr	Asn	Ile	Val	Tyr	Lys	Glu	Ala		
		900						905					910				
Lys	Glu	Ser	Val	Asp	Ala	Leu	Phe	Val	Asn	Ser	Gln	Tyr	Asp	Arg	Leu		
	915						920					925					
Gln	Val	Asp	Thr	Asn	Ile	Ala	Met	Ile	His	Ala	Ala	Asp	Lys	Arg	Val		
930					935						940						
His	Arg	Ile	Arg	Glu	Ala	Tyr	Leu	Pro	Glu	Leu	Ser	Val	Ile	Pro	Gly		
945					950					955					960		
Val	Asn	Ala	Ala	Ile	Phe	Glu	Glu	Leu	Glu	Gly	Arg	Ile	Phe	Thr	Ala		
			965					970						975			
Tyr	Ser	Leu	Tyr	Asp	Ala	Arg	Asn	Val	Ile	Lys	Asn	Gly	Asp	Phe	Asn		
		980					985						990				
Asn	Gly	Leu	Leu	Cys	Trp	Asn	Val	Lys	Gly	His	Val	Asp	Val	Glu	Glu		
	995					1000					1005						
Gln	Asn	Asn	His	Arg	Ser	Val	Leu	Val	Ile	Pro	Glu	Trp	Glu	Ala	Glu		
1010					1015					1020							
Val	Ser	Gln	Glu	Val	Arg	Val	Cys	Pro	Gly	Arg	Gly	Tyr	Ile	Leu	Arg		
025				1030					1035					1040			
Val	Thr	Ala	Tyr	Lys	Glu	Gly	Tyr	Gly	Glu	Gly	Cys	Val	Thr	Ile	His		
		1045					1050						1055				
Glu	Ile	Glu	Asp	Asn	Thr	Asp	Glu	Leu	Lys	Phe	Ser	Asn	Cys	Val	Glu		
	1060						1065					1070					
Glu	Glu	Val	Tyr	Pro	Asn	Asn	Thr	Val	Thr	Cys	Asn	Asn	Tyr	Thr	Gly		
	1075				1080						1085						

Thr Gln Glu Glu Tyr Glu Gly Thr Tyr Thr Ser Arg Asn Gln Gly Tyr
 1090 1095 1100
 Asp Glu Ala Tyr Gly Asn Asn Pro Ser Val Pro Ala Asp Tyr Ala Ser
 105 1110 1115 1120
 Val Tyr Glu Glu Lys Ser Tyr Thr Asp Gly Arg Arg Glu Asn Pro Cys
 1125 1130 1135
 Glu Ser Asn Arg Gly Tyr Gly Asp Tyr Thr Pro Leu Pro Ala Gly Tyr
 1140 1145 1150
 Val Thr Lys Asp Leu Glu Tyr Phe Pro Glu Thr Asp Lys Val Trp Ile
 1155 1160 1165
 Glu Ile Gly Glu Thr Glu Gly Thr Phe Ile Val Asp Ser Val Glu Leu
 1170 1175 1180
 Leu Leu Met Glu Glu
 185

<210> 1
 <211> 3687
 <212> DNA
 <213> *Bacillus thuringiensis*

<220>
 <221> CDS
 <222> (1)..(3687)

<400> 9
 ttg act tca aat agg aaa aat gag aat gaa att ata aat gct gta tcg 48
 Leu Thr Ser Asn Arg Lys Asn Glu Asn Glu Ile Ile Asn Ala Val Ser
 1 5 10 15
 aat cat tcc gca caa atg gat cta tta cca gat gct cgt att gag gat 96
 Asn His Ser Ala Gln Met Asp Leu Leu Pro Asp Ala Arg Ile Glu Asp
 20 25 30
 agc ttg tgt ata gcc gag ggg aac aat att gat cca ttt gtt agc gca 144
 Ser Leu Cys Ile Ala Glu Gly Asn Asn Ile Asp Pro Phe Val Ser Ala
 35 40 45
 tca aca gtc caa acg ggt att aac ata gct ggt aga ata cta ggc gta 192
 Ser Thr Val Gln Thr Gly Ile Asn Ile Ala Gly Arg Ile Leu Gly Val
 50 55 60
 ttg ggc gta ccg ttt gct gga caa cta gct agt ttt tat agt ttt ctt 240
 Leu Gly Val Pro Phe Ala Gly Gln Leu Ala Ser Phe Tyr Ser Phe Leu
 65 70 75 80
 gtt ggt gaa tta tgg ccc cgc ggc aga gat cag tgg gaa att ttc cta 288

Val	Gly	Glu	Leu	Trp	Pro	Arg	Gly	Arg	Asp	Gln	Trp	Glu	Ile	Phe	Leu	
				85					90					95		
gaa	cat	gtc	gaa	caa	ctt	ata	aat	caa	caa	ata	aca	gaa	aat	gct	agg	336
Glu	His	Val	Glu	Gln	Leu	Ile	Asn	Gln	Gln	Ile	Thr	Glu	Asn	Ala	Arg	
			100					105					110			
aat	acg	gct	ctt	gct	cga	tta	caa	ggc	tta	gga	gat	tcc	ttc	aga	gcc	384
Asn	Thr	Ala	Leu	Ala	Arg	Leu	Gln	Gly	Leu	Gly	Asp	Ser	Phe	Arg	Ala	
		115					120					125				
tat	caa	cag	tca	ctt	gaa	gat	tgg	cta	gaa	aac	cgt	gat	gat	gca	aga	432
Tyr	Gln	Gln	Ser	Leu	Glu	Asp	Trp	Leu	Glu	Asn	Arg	Asp	Asp	Ala	Arg	
	130					135				140						
acg	aga	agt	gtt	ctt	cat	acc	caa	tat	ata	gct	tta	gaa	ctt	gat	ttt	480
Thr	Arg	Ser	Val	Leu	His	Thr	Gln	Tyr	Ile	Ala	Leu	Glu	Leu	Asp	Phe	
145					150					155					160	
ctt	aat	gcg	atg	ccg	ctt	ttc	gca	att	aga	aac	caa	gaa	gtt	cca	tta	528
Leu	Asn	Ala	Met	Pro	Leu	Phe	Ala	Ile	Arg	Asn	Gln	Glu	Val	Pro	Leu	
			165						170					175		
ttg	atg	gta	tat	gct	caa	gct	gca	aat	tta	cac	cta	tta	tta	ttg	aga	576
Leu	Met	Val	Tyr	Ala	Gln	Ala	Ala	Asn	Leu	His	Leu	Leu	Leu	Leu	Arg	
		180						185					190			
gat	gcc	tct	ctt	ttt	ggc	agt	gaa	ttt	ggg	ctt	aca	tcg	cag	gaa	att	624
Asp	Ala	Ser	Leu	Phe	Gly	Ser	Glu	Phe	Gly	Leu	Thr	Ser	Gln	Glu	Ile	
		195					200					205				
caa	cgc	tat	tat	gag	cgc	caa	gtg	gaa	cga	acg	aga	gat	tat	tcc	gac	672
Gln	Arg	Tyr	Tyr	Glu	Arg	Gln	Val	Glu	Arg	Thr	Arg	Asp	Tyr	Ser	Asp	
	210					215					220					
tat	tgc	gta	gaa	tgg	tat	aat	aca	ggc	cta	aat	agc	ttg	aga	ggg	aca	720
Tyr	Cys	Val	Glu	Trp	Tyr	Asn	Thr	Gly	Leu	Asn	Ser	Leu	Arg	Gly	Thr	
225					230				235					240		
aat	gcc	gca	agt	tgg	gta	cgg	tat	aat	caa	ttc	cgt	aga	gat	cta	acg	768
Asn	Ala	Ala	Ser	Trp	Val	Arg	Tyr	Asn	Gln	Phe	Arg	Arg	Asp	Leu	Thr	
			245						250					255		
tta	gga	gta	tta	gat	cta	gtg	gca	cta	ttc	cca	agc	tat	gac	act	cgc	816
Leu	Gly	Val	Leu	Asp	Leu	Val	Ala	Leu	Phe	Pro	Ser	Tyr	Asp	Thr	Arg	
		260					265						270			
act	tat	cca	ata	aat	acg	agt	gct	cag	tta	aca	aga	gaa	gtt	tat	aca	864
Thr	Tyr	Pro	Ile	Asn	Thr	Ser	Ala	Gln	Leu	Thr	Arg	Glu	Val	Tyr	Thr	
		275					280					285				
gac	gca	att	gga	gca	aca	ggg	gta	aat	atg	gca	agt	atg	aat	tgg	tat	912
Asp	Ala	Ile	Gly	Ala	Thr	Gly	Val	Asn	Met	Ala	Ser	Met	Asn	Trp	Tyr	

290	295	300	
aat aat aat gca cct tgc ttc tct gcc ata gag gct gcg gct atc cga			960
Asn Asn Asn Ala Pro Ser Phe Ser Ala Ile Glu Ala Ala Ala Ile Arg			
305	310	315	320
agc ccg cat cta ctt gat ttt cta gaa caa ctt aca att ttt agc gct			1008
Ser Pro His Leu Leu Asp Phe Leu Glu Gln Leu Thr Ile Phe Ser Ala			
325	330		335
tca tca cga tgg agt aat act agg cat atg act tat tgg cgg ggg cac			1056
Ser Ser Arg Trp Ser Asn Thr Arg His Met Thr Tyr Trp Arg Gly His			
340	345		350
acg att caa tct cgg cca ata gga ggc gga tta aat acc tca acg cat			1104
Thr Ile Gln Ser Arg Pro Ile Gly Gly Gly Leu Asn Thr Ser Thr His			
355	360		365
ggg gct acc aat act tct att aat cct gta aca tta cgg ttc gca tct			1152
Gly Ala Thr Asn Thr Ser Ile Asn Pro Val Thr Leu Arg Phe Ala Ser			
370	375		380
cga gac gtt tat agg act gaa tca tat gca gga gtg ctt cta tgg gga			1200
Arg Asp Val Tyr Arg Thr Glu Ser Tyr Ala Gly Val Leu Leu Trp Gly			
385	390	395	400
att tac ctt gaa cct att cat ggt gtc cct act gtt agg ttt aat ttt			1248
Ile Tyr Leu Glu Pro Ile His Gly Val Pro Thr Val Arg Phe Asn Phe			
405	410		415
acg aac cct cag aat att tct gat aga ggt acc gct aac tat agt caa			1296
Thr Asn Pro Gln Asn Ile Ser Asp Arg Gly Thr Ala Asn Tyr Ser Gln			
420	425		430
cct tat gag tca cct ggg ctt caa tta aaa gat tca gaa act gaa tta			1344
Pro Tyr Glu Ser Pro Gly Leu Gln Leu Lys Asp Ser Glu Thr Glu Leu			
435	440		445
cca cca gaa aca aca gaa cga cca aat tat gaa tct tac agt cac agg			1392
Pro Pro Glu Thr Thr Glu Arg Pro Asn Tyr Glu Ser Tyr Ser His Arg			
450	455		460
tta tct cat ata ggt ata att tta caa tcc agg gtg aat gta ccg gta			1440
Leu Ser His Ile Gly Ile Ile Leu Gln Ser Arg Val Asn Val Pro Val			
465	470	475	480
tat tct tgg acg cat cgt agt gca gat cgt acg aat acg att gga cca			1488
Tyr Ser Trp Thr His Arg Ser Ala Asp Arg Thr Asn Thr Ile Gly Pro			
485	490		495
aat aga atc acc caa atc cca atg gta aaa gca tcc gaa ctt cct caa			1536
Asn Arg Ile Thr Gln Ile Pro Met Val Lys Ala Ser Glu Leu Pro Gln			
500	505		510

ggt acc act gtt gtt aga gga cca gga ttt act ggt ggg gat att ctt	1584
Gly Thr Thr Val Val Arg Gly Pro Gly Phe Thr Gly Gly Asp Ile Leu	
515 520 525	
cga aga acg aat act ggt gga ttt gga ccg ata aga gta act gtt aac	1632
Arg Arg Thr Asn Thr Gly Gly Phe Gly Pro Ile Arg Val Thr Val Asn	
530 535 540	
gga cca tta aca caa aga tat cgt ata gga ttc cgc tat gct tca act	1680
Gly Pro Leu Thr Gln Arg Tyr Arg Ile Gly Phe Arg Tyr Ala Ser Thr	
545 550 555 560	
gta gat ttt gat ttc ttt gta tca cgt gga ggt act act gta aat aat	1728
Val Asp Phe Asp Phe Phe Val Ser Arg Gly Gly Thr Thr Val Asn Asn	
565 570 575	
ttt aga ttc cta cgt aca atg aac agt gga gac gaa cta aaa tac gga	1776
Phe Arg Phe Leu Arg Thr Met Asn Ser Gly Asp Glu Leu Lys Tyr Gly	
580 585 590	
aat ttt gtg aga cgt gct ttt act aca cct ttt act ttt aca caa att	1824
Asn Phe Val Arg Arg Ala Phe Thr Thr Pro Phe Thr Phe Thr Gln Ile	
595 600 605	
caa gat ata att cga acg tct att caa ggc ctt agt gga aat ggg gaa	1872
Gln Asp Ile Ile Arg Thr Ser Ile Gln Gly Leu Ser Gly Asn Gly Glu	
610 615 620	
gtg tat ata gat aaa att gaa att att cca gtt act gca acc ttc gaa	1920
Val Tyr Ile Asp Lys Ile Glu Ile Ile Pro Val Thr Ala Thr Phe Glu	
625 630 635 640	
gca gaa tat gat tta gaa aga gcg caa gag gcg gtg aat gct ctg ttt	1968
Ala Glu Tyr Asp Leu Glu Arg Ala Gln Glu Ala Val Asn Ala Leu Phe	
645 650 655	
act aat acg aat cca aga aga ttg aaa aca gat gtg aca gat tat cat	2016
Thr Asn Thr Asn Pro Arg Arg Leu Lys Thr Asp Val Thr Asp Tyr His	
660 665 670	
att gat caa gta tcc aat tta gtg gcg tgt tta tcg gat gaa ttc tgc	2064
Ile Asp Gln Val Ser Asn Leu Val Ala Cys Leu Ser Asp Glu Phe Cys	
675 680 685	
ttg gat gaa aag aga gaa tta ctt gag aaa gtg aaa tat gcg aaa cga	2112
Leu Asp Glu Lys Arg Glu Leu Leu Glu Lys Val Lys Tyr Ala Lys Arg	
690 695 700	
ctc agt gat gaa aga aac tta ctc caa gat cca aac ttc aca tcc atc	2160
Leu Ser Asp Glu Arg Asn Leu Leu Gln Asp Pro Asn Phe Thr Ser Ile	
705 710 715 720	
aat aag caa cca gac ttc ata tct act aat gag caa tcg aat ttc aca	2208

Asn Lys Gln Pro Asp Phe Ile Ser Thr Asn Glu Gln Ser Asn Phe Thr	
725 730 735	
tct atc cat gaa caa tct gaa cat gga tgg tgg gga agt gag aac att	2256
Ser Ile His Glu Gln Ser Glu His Gly Trp Trp Gly Ser Glu Asn Ile	
740 745 750	
acc atc cag gaa gga aat gac gta ttt aaa gag aat tac gtc aca cta	2304
Thr Ile Gln Glu Gly Asn Asp Val Phe Lys Glu Asn Tyr Val Thr Leu	
755 760 765	
ccg ggt act ttt aat gag tgt tat ccg acg tat tta tat caa aaa ata	2352
Pro Gly Thr Phe Asn Glu Cys Tyr Pro Thr Tyr Leu Tyr Gln Lys Ile	
770 775 780	
ggg gag tcg gaa tta aaa gct tat act cgc tac caa tta aga ggt tat	2400
Gly Glu Ser Glu Leu Lys Ala Tyr Thr Arg Tyr Gln Leu Arg Gly Tyr	
785 790 795 800	
att gaa gat agt caa gat tta gag ata tat ttg att cgt tat aat gcg	2448
Ile Glu Asp Ser Gln Asp Leu Glu Ile Tyr Leu Ile Arg Tyr Asn Ala	
805 810 815	
aaa cat gaa aca ttg gat gtt cca ggt acc gag tcc cta tgg ccg ctt	2496
Lys His Glu Thr Leu Asp Val Pro Gly Thr Glu Ser Leu Trp Pro Leu	
820 825 830	
tca gtt gaa agc cca atc gga agg tgc gga gaa ccg aat cga tgc gca	2544
Ser Val Glu Ser Pro Ile Gly Arg Cys Gly Glu Pro Asn Arg Cys Ala	
835 840 845	
cca cat ttt gaa tgg aat cct gat cta gat tgt tcc tgc aga gat gga	2592
Pro His Phe Glu Trp Asn Pro Asp Leu Asp Cys Ser Cys Arg Asp Gly	
850 855 860	
gaa aaa tgt gcg cat cat tcc cat cat ttc tct ttg gat att gat gtt	2640
Glu Lys Cys Ala His His Ser His His Phe Ser Leu Asp Ile Asp Val	
865 870 875 880	
gga tgc aca gac ttg cat gag aat cta ggc gtg tgg gtg gta ttc aag	2688
Gly Cys Thr Asp Leu His Glu Asn Leu Gly Val Trp Val Val Phe Lys	
885 890 895	
att aag acg cag gaa ggt cat gca aga cta ggg aat ctg gaa ttt att	2736
Ile Lys Thr Gln Glu Gly His Ala Arg Leu Gly Asn Leu Glu Phe Ile	
900 905 910	
gaa gag aaa cca tta tta gga gaa gca ctg tct cgt gtg aag agg gca	2784
Glu Glu Lys Pro Leu Leu Gly Glu Ala Leu Ser Arg Val Lys Arg Ala	
915 920 925	
gag aaa aaa tgg aga gac aaa cgt gaa aaa cta caa ttg gaa aca aaa	2832
Glu Lys Lys Trp Arg Asp Lys Arg Glu Lys Leu Gln Leu Glu Thr Lys	

930	935	940	
cga gta tat aca gag gca aaa gaa gct gtg gat gct tta ttc gta gat			2880
Arg Val Tyr Thr Glu Ala Lys Glu Ala Val Asp Ala Leu Phe Val Asp			
945	950	955	960
tct caa tat gat aga tta caa gcg gat aca aac atc ggc atg att cat			2928
Ser Gln Tyr Asp Arg Leu Gln Ala Asp Thr Asn Ile Gly Met Ile His			
965	970	975	
gcg gca gat aaa ctt gtt cat cga att cga gag gcg tat ctt tca gaa			2976
Ala Ala Asp Lys Leu Val His Arg Ile Arg Glu Ala Tyr Leu Ser Glu			
980	985	990	
tta cct gtt atc cca ggt gta aat gcg gaa att ttt gaa gaa tta gaa			3024
Leu Pro Val Ile Pro Gly Val Asn Ala Glu Ile Phe Glu Glu Leu Glu			
995	1000	1005	
ggt cac att atc act gca atc tcc tta tac gat gcg aga aat gtc			3069
Gly His Ile Ile Thr Ala Ile Ser Leu Tyr Asp Ala Arg Asn Val			
1010	1015	1020	
gtt aaa aat ggt gat ttt aat aat gga tta aca tgt tgg aat gta			3114
Val Lys Asn Gly Asp Phe Asn Asn Gly Leu Thr Cys Trp Asn Val			
1025	1030	1035	
aaa ggg cat gta gat gta caa cag agc cat cat cgt tct gac ctt			3159
Lys Gly His Val Asp Val Gln Gln Ser His His Arg Ser Asp Leu			
1040	1045	1050	
gtt atc cca gaa tgg gaa gca gaa gtg tca caa gca gtt cgc gtc			3204
Val Ile Pro Glu Trp Glu Ala Glu Val Ser Gln Ala Val Arg Val			
1055	1060	1065	
tgt ccg ggg tgt ggc tat atc ctt cgt gtc aca gcg tac aaa gag			3249
Cys Pro Gly Cys Gly Tyr Ile Leu Arg Val Thr Ala Tyr Lys Glu			
1070	1075	1080	
gga tat gga gag ggc tgc gta acg atc cat gaa atc gag aac aat			3294
Gly Tyr Gly Glu Gly Cys Val Thr Ile His Glu Ile Glu Asn Asn			
1085	1090	1095	
aca gac gaa cta aaa ttt aaa aac cgt gaa gaa gag gaa gtg tat			3339
Thr Asp Glu Leu Lys Phe Lys Asn Arg Glu Glu Glu Glu Val Tyr			
1100	1105	1110	
cca acg gat aca gga acg tgt aat gat tat act gca cac caa ggt			3384
Pro Thr Asp Thr Gly Thr Cys Asn Asp Tyr Thr Ala His Gln Gly			
1115	1120	1125	
aca gct gga tgc gca gat gca tgt aat tcc cgt aat gct gga tat			3429
Thr Ala Gly Cys Ala Asp Ala Cys Asn Ser Arg Asn Ala Gly Tyr			
1130	1135	1140	

	85		90		95
Glu His Val	Glu Gln Leu Ile	Asn Gln Gln Ile Thr	Glu Asn Ala Arg		
	100	105	110		
Asn Thr Ala	Leu Ala Arg Leu	Gln Gly Leu Gly Asp	Ser Phe Arg Ala		
	115	120	125		
Tyr Gln Gln	Ser Leu Glu Asp	Trp Leu Glu Asn	Arg Asp Asp Ala Arg		
	130	135	140		
Thr Arg Ser	Val Leu His Thr	Gln Tyr Ile Ala	Leu Glu Leu Asp Phe		
	145	150	155	160	
Leu Asn Ala	Met Pro Leu Phe	Ala Ile Arg Asn	Gln Glu Val Pro Leu		
	165	170	175		
Leu Met Val	Tyr Ala Gln Ala	Ala Asn Leu His	Leu Leu Leu Leu Arg		
	180	185	190		
Asp Ala Ser	Leu Phe Gly Ser	Glu Phe Gly Leu Thr	Ser Gln Glu Ile		
	195	200	205		
Gln Arg Tyr	Tyr Glu Arg Gln	Val Glu Arg Thr	Arg Asp Tyr Ser Asp		
	210	215	220		
Tyr Cys Val	Glu Trp Tyr Asn	Thr Gly Leu Asn	Ser Leu Arg Gly Thr		
	225	230	235	240	
Asn Ala Ala	Ser Trp Val Arg	Tyr Asn Gln Phe	Arg Arg Asp Leu Thr		
	245	250	255		
Leu Gly Val	Leu Asp Leu Val	Ala Leu Phe Pro	Ser Tyr Asp Thr Arg		
	260	265	270		
Thr Tyr Pro	Ile Asn Thr Ser	Ala Gln Leu Thr	Arg Glu Val Tyr Thr		
	275	280	285		
Asp Ala Ile	Gly Ala Thr Gly	Val Asn Met Ala	Ser Met Asn Trp Tyr		
	290	295	300		

Asn Asn Asn Ala Pro Ser Phe Ser Ala Ile Glu Ala Ala Ala Ile Arg
305 310 315 320

Ser Pro His Leu Leu Asp Phe Leu Glu Gln Leu Thr Ile Phe Ser Ala
325 330 335

Ser Ser Arg Trp Ser Asn Thr Arg His Met Thr Tyr Trp Arg Gly His
340 345 350

Thr Ile Gln Ser Arg Pro Ile Gly Gly Gly Leu Asn Thr Ser Thr His
355 360 365

Gly Ala Thr Asn Thr Ser Ile Asn Pro Val Thr Leu Arg Phe Ala Ser
370 375 380

Arg Asp Val Tyr Arg Thr Glu Ser Tyr Ala Gly Val Leu Leu Trp Gly
385 390 395 400

Ile Tyr Leu Glu Pro Ile His Gly Val Pro Thr Val Arg Phe Asn Phe
405 410 415

Thr Asn Pro Gln Asn Ile Ser Asp Arg Gly Thr Ala Asn Tyr Ser Gln
420 425 430

Pro Tyr Glu Ser Pro Gly Leu Gln Leu Lys Asp Ser Glu Thr Glu Leu
435 440 445

Pro Pro Glu Thr Thr Glu Arg Pro Asn Tyr Glu Ser Tyr Ser His Arg
450 455 460

Leu Ser His Ile Gly Ile Ile Leu Gln Ser Arg Val Asn Val Pro Val
465 470 475 480

Tyr Ser Trp Thr His Arg Ser Ala Asp Arg Thr Asn Thr Ile Gly Pro
485 490 495

Asn Arg Ile Thr Gln Ile Pro Met Val Lys Ala Ser Glu Leu Pro Gln
500 505 510

Gly Thr Thr Val Val Arg Gly Pro Gly Phe Thr Gly Gly Asp Ile Leu
515 520 525

Arg Arg Thr Asn Thr Gly Gly Phe Gly Pro Ile Arg Val Thr Val Asn
530 535 540

Gly Pro Leu Thr Gln Arg Tyr Arg Ile Gly Phe Arg Tyr Ala Ser Thr
545 550 555 560

Val Asp Phe Asp Phe Phe Val Ser Arg Gly Gly Thr Thr Val Asn Asn
565 570 575

Phe Arg Phe Leu Arg Thr Met Asn Ser Gly Asp Glu Leu Lys Tyr Gly
580 585 590

Asn Phe Val Arg Arg Ala Phe Thr Thr Pro Phe Thr Phe Thr Gln Ile
595 600 605

Gln Asp Ile Ile Arg Thr Ser Ile Gln Gly Leu Ser Gly Asn Gly Glu
610 615 620

Val Tyr Ile Asp Lys Ile Glu Ile Ile Pro Val Thr Ala Thr Phe Glu
625 630 635 640

Ala Glu Tyr Asp Leu Glu Arg Ala Gln Glu Ala Val Asn Ala Leu Phe
645 650 655

Thr Asn Thr Asn Pro Arg Arg Leu Lys Thr Asp Val Thr Asp Tyr His
660 665 670

Ile Asp Gln Val Ser Asn Leu Val Ala Cys Leu Ser Asp Glu Phe Cys
675 680 685

Leu Asp Glu Lys Arg Glu Leu Leu Glu Lys Val Lys Tyr Ala Lys Arg
690 695 700

Leu Ser Asp Glu Arg Asn Leu Leu Gln Asp Pro Asn Phe Thr Ser Ile
705 710 715 720

Asn Lys Gln Pro Asp Phe Ile Ser Thr Asn Glu Gln Ser Asn Phe Thr

	725		730		735
Ser Ile His Glu Gln Ser Glu His Gly Trp Trp Gly Ser Glu Asn Ile	740		745		750
Thr Ile Gln Glu Gly Asn Asp Val Phe Lys Glu Asn Tyr Val Thr Leu	755		760		765
Pro Gly Thr Phe Asn Glu Cys Tyr Pro Thr Tyr Leu Tyr Gln Lys Ile	770		775		780
Gly Glu Ser Glu Leu Lys Ala Tyr Thr Arg Tyr Gln Leu Arg Gly Tyr	785		790		800
Ile Glu Asp Ser Gln Asp Leu Glu Ile Tyr Leu Ile Arg Tyr Asn Ala	805		810		815
Lys His Glu Thr Leu Asp Val Pro Gly Thr Glu Ser Leu Trp Pro Leu	820		825		830
Ser Val Glu Ser Pro Ile Gly Arg Cys Gly Glu Pro Asn Arg Cys Ala	835		840		845
Pro His Phe Glu Trp Asn Pro Asp Leu Asp Cys Ser Cys Arg Asp Gly	850		855		860
Glu Lys Cys Ala His His Ser His His Phe Ser Leu Asp Ile Asp Val	865		870		875
					880
Gly Cys Thr Asp Leu His Glu Asn Leu Gly Val Trp Val Val Phe Lys	885		890		895
Ile Lys Thr Gln Glu Gly His Ala Arg Leu Gly Asn Leu Glu Phe Ile	900		905		910
Glu Glu Lys Pro Leu Leu Gly Glu Ala Leu Ser Arg Val Lys Arg Ala	915		920		925
Glu Lys Lys Trp Arg Asp Lys Arg Glu Lys Leu Gln Leu Glu Thr Lys	930		935		940

Arg Val Tyr Thr Glu Ala Lys Glu Ala Val Asp Ala Leu Phe Val Asp
945 950 955 960

Ser Gln Tyr Asp Arg Leu Gln Ala Asp Thr Asn Ile Gly Met Ile His
965 970 975

Ala Ala Asp Lys Leu Val His Arg Ile Arg Glu Ala Tyr Leu Ser Glu
980 985 990

Leu Pro Val Ile Pro Gly Val Asn Ala Glu Ile Phe Glu Glu Leu Glu
995 1000 1005

Gly His Ile Ile Thr Ala Ile Ser Leu Tyr Asp Ala Arg Asn Val
1010 1015 1020

Val Lys Asn Gly Asp Phe Asn Asn Gly Leu Thr Cys Trp Asn Val
1025 1030 1035

Lys Gly His Val Asp Val Gln Gln Ser His His Arg Ser Asp Leu
1040 1045 1050

Val Ile Pro Glu Trp Glu Ala Glu Val Ser Gln Ala Val Arg Val
1055 1060 1065

Cys Pro Gly Cys Gly Tyr Ile Leu Arg Val Thr Ala Tyr Lys Glu
1070 1075 1080

Gly Tyr Gly Glu Gly Cys Val Thr Ile His Glu Ile Glu Asn Asn
1085 1090 1095

Thr Asp Glu Leu Lys Phe Lys Asn Arg Glu Glu Glu Glu Val Tyr
1100 1105 1110

Pro Thr Asp Thr Gly Thr Cys Asn Asp Tyr Thr Ala His Gln Gly
1115 1120 1125

Thr Ala Gly Cys Ala Asp Ala Cys Asn Ser Arg Asn Ala Gly Tyr
1130 1135 1140

Glu Asp Ala Tyr Glu Val Asp Thr Thr Ala Ser Val Asn Tyr Lys
1145 1150 1155

Pro Thr Tyr Glu Glu Glu Thr Tyr Thr Asp Val Arg Arg Asp Asn
1160 1165 1170

His Cys Glu Tyr Asp Arg Gly Tyr Val Asn Tyr Pro Pro Val Pro
1175 1180 1185

Ala Gly Tyr Val Thr Lys Glu Leu Glu Tyr Phe Pro Glu Thr Asp
1190 1195 1200

Thr Val Trp Ile Glu Ile Gly Glu Thr Glu Gly Lys Phe Ile Val
1205 1210 1215

Asp Ser Val Glu Leu Leu Leu Met Glu Glu
1220 1225